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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/918,573	08/01/2001	Cary Lee Bates	ROC920010153US1-IBM	3523

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EXAMINER	
MITCHELL, JASON D	

ART UNIT	PAPER NUMBER
2124	211

DATE MAILED: 09/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/918,573	BATES ET AL.
	Examiner	Art Unit
	Jason Mitchell	2124

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 August 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/01/2001*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This action is in response to the application filed on 08/01/2001

Claims 1-15 are pending in this application.

Claim Objections

Claims 1-5 and 11-15 are objected to because of the following informalities:

Claims 1-5 refer to 'A program debugger', while claims 11-15 disclose 'An article of manufacture'. The distinction is not clear, making claims 11-15 repetitious.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 6, 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Wahbe et al, "Practical Data Breakpoints: Design and Implementation" 1993, AMC (Wahbe).

Regarding Claim 1, 6, 11: Wahbe discloses A Program debugger, for reducing debugger impact through motion of an IV-breakpoint. (pg. 8, col. 2, par. 5, lines 1-3) And means for extracting, the induction rate. (pg. 8, col. 2, par. 5, lines 1-3 and par. 6, lines 2-4 'each monotonic variable must increase or decrease

monotonically') And means for extracting a final value for which the IV-breakpoint may be satisfied. (pg. 9, col. 1, par. 3, lines 1-4 'bounds') And means for removing the IV-breakpoint, (pg. 8, col. 2, par. 5, lines 4-6 'replaces checks on monotonic writes with range checks in the loop pre-header') if it is satisfied and the induction variable would be beyond the final value upon a next iteration (pg. 8, col. 2, par. 5, lines 1-3 'range check in the pre-header')

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2-5, 7-10, and 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wahbe et al, "Practical Data Breakpoints: Design and Implementation" 1993, AMC (Wahbe) in view of Hanson et al., "A Machine-Independent Debugger", Software- Practice and Experience, Nov 1996.

Regarding Claim 2, 7, 12: The rejection of claim 1 is incorporated, further; Wahbe teaches reestablishing the IV-breakpoint (pg. 10, col. 1, par. 2, lines 8-9) if said first reset breakpoint (pg. 10, col. 1, par. 1, lines 3-5 'range check in the loop pre-header') is satisfied, but does not teach setting, at a first loop exit program position a first reset breakpoint. Instead Wahbe places a range check in

the pre-header, (pg. 10, col. 1, par. 1, lines 3-5 'range check in the loop pre-header') and other instructions related to the IV-breakpoint at all loop exits. (pg. 10, col. 1, par. 3, lines 8-10 'At all exits ... a code sequence that deletes these monitored regions').

Hanson teaches setting, at a first loop exit program position, a first reset breakpoint, (pg. 1282, par. 4 'can set breakpoints on ... exit points of compound statements') in an analogous art for the purpose of detecting when the loop is exited.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the teachings of Hanson to move the range check described in Wahbe to the loop exit points. As mentioned above Wahbe already uses the exit points to check and remove watch points. (pg. 10, col. 1, par. 3, lines 8-10 'deletes these monitored regions')

The modification would have been obvious because one of ordinary skill in the art would have been motivated to check the state of the program, particularly the IV-variable, upon exiting the loop. (Wahbe pg. 10, col. 1 par. 3, lines 10-12 'requires verification of program control flow').

Regarding Claim 3, 8, 13: The rejection of claim 2 is incorporated, further; Wahbe does not disclose removing said first reset breakpoint if said first reset breakpoint is satisfied. But does disclose setting and removing breakpoints based on conditions calculated from the state of execution, (pg.10, col.1, par 2, lines, 6-9 'restores the eliminated write check')

Hanson teaches removing said first reset breakpoint, (pg. 1280, par. 3 '_Nub_Remove...remove breakpoints') in an analogous art so that execution is no longer halted at that point in the program.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the teachings of Hanson (pg. 1280, par. 3 '_Nub_Remove...remove breakpoints') to remove breakpoints that would no longer be used, (i.e. the reset breakpoint) thereby improving the efficiency of Wahbe's invention. Wahbe teaches doing this with the IV-breakpoint (pg.10, col.1, par 2, lines, 6-9 'restores the eliminated write check') and discusses the importance of removing unnecessary write checks (pg. 7, col. 1, par. 4, lines 4-6 'eliminating unnecessary write checks').

The modification would have been obvious because one of ordinary skill in the art would have been motivated to eliminate unnecessary execution halts and comparisons, thereby improving efficiency. (Wahbe pg. 7, col. 1, par. 4 'eliminating unnecessary write checks').

Regarding Claim 4, 9, 14: The rejection of claim 2 is incorporated, further; Wahbe teaches reestablishing the IV-breakpoint if one of said first and second reset breakpoints is satisfied. (pg.10, col.1, par 2, lines, 6-9 'restores the eliminated write check') But does not teach setting at a second loop exit program position, a second reset breakpoint. Wahbe does however place other instructions related to the IV-breakpoint at all loop exits. (pg. 10, col. 1, par. 3, lines 8-10 'deletes these monitored regions').

Hanson teaches setting at a second loop exit program position, a second reset breakpoint, (pg. 1282, par. 4 'can set breakpoints on ... exit points of compound statements') in an analogous art for the purpose of detecting when the loop is exited.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the teachings of Hanson (pg. 1282, par. 4 'can set breakpoints on ... exit points of compound statements') to move the range check described in Wahbe (pg. 10, col. 1, par. 1, lines 3-5 'range check in the loop pre-header') to the loop exit points. As mentioned above Wahbe already uses the exit points to check and remove watch points. (pg. 10, col. 1, par. 3, lines 8-10 'deletes these monitored regions').

The modification would have been obvious because one of ordinary skill in the art would have been motivated to check the state of the program, particularly the IV-variable, upon exiting the loop. (Wahbe pg. 10, col. 1 par. 3, lines 10-12 'requires verification of program control flow').

Regarding Claim 5, 10, 15: the rejection of claim 4 is incorporated, further; Wahbe does not disclose removing said first reset breakpoint if said first reset breakpoint is satisfied. But does disclose setting and removing breakpoints based on conditions calculated from the state of execution, (pg.10, col.1, par 2, lines, 6-9 'restores the eliminated write check')

Hanson teaches a method of removing said first and second reset breakpoint, (pg. 1280, par. 3 '_Nub_Remove...remove breakpoints') in an analogous art so that execution is no longer halted at that point in the program.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the teachings of Hanson (pg. 1280, par. 3 '_Nub_Remove...remove breakpoints') to remove breakpoints that would no longer be used, (i.e. the reset breakpoint) thereby improving the efficiency of Wahbe's invention. Wahbe teaches doing this with the IV-breakpoint (pg.10, col.1, par 2, lines, 6-9 'restores the eliminated write check') and discusses the importance of removing unnecessary write checks (pg. 7, col. 1, par. 4, lines 4-6 'eliminating unnecessary write checks').

The modification would have been obvious because one of ordinary skill in the art would have been motivated to eliminate unnecessary execution halts and comparisons, thereby improving efficiency. (Wahbe pg. 7, col. 1, par. 4 'eliminating unnecessary write checks').

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Mitchell whose telephone number is (703)305-0064. The examiner can normally be reached on 7:30am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (703)305-9662. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason Mitchell
Patent Examiner
AU 2122
July 29, 2004

JOHN CHAVIS
PATENT EXAMINER
ART UNIT 2124